# NOTICES FROM THE LICK OBSERVATORY.*

PREPARED BY MEMBERS OF THE STAFF.

## COMET *b* 1902 (PERRINE).

This comet is proving to be of more than usual interest, by reason of its rapidity of motion, its brightness, the long duration of its apparition period, and its close approach to the planet *Mercury*.

As seen from the Earth, at the time of discovery, the comet was moving slowly northward and westward, but the first calculation of its orbit showed that its motion would rapidly increase and that it would pass within about thirty-five millions of miles of the Earth on about the 8th of October. As it was also coming toward the Sun, its brightness would increase rapidly, reaching its maximum at the time of nearest approach to the Earth, provided, that is, that it was shining by reflected sunlight.

Assuming that the brightness at discovery was that of a 9th-magnitude star, its theoretical brightness on October 8th should have been about that of a 5½-magnitude star, and should then have diminished slowly.

Observations made here show that the comet somewhat exceeded its theoretical brightness, being easily visible to the naked eye as early as September 24th, and that its light did not diminish as fast in the latter part of October as the theory of reflected light required. This will appear from a few estimates of its brightness taken from my observing notes.

Sept. 24. Comet as bright as 6.1 magnitude star near south following. Easily visible to naked eye.

Oct. 3. Comet fully as bright as 5th magnitude star.

Oct. 14. Comet passed between 109 and 110 *Herculis*. Very little fainter than these stars. Certainly not a half

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magnitude. [The Harvard Photometry gives the magnitudes of 109 and 110 *Herculis* as 3.9 and 4.2, respectively.]

Oct. 21. Comet near a star 5.9 magnitude, and is at least a magnitude brighter.

Oct. 27. Comet fully as bright as 5th magnitude.

Nov. 4. Comet still easily seen with naked eye, though very low in the sky.

While there is thus evidence that the comet's light is not all reflected light, there have been so far no erratic variations in its brightness such as sometimes characterize a comet on its approach to the Sun.

The comet's approach to the Earth is closer than the average, but not sufficiently close to be worthy of special remark, but the close approach that Mr. F. E. SEAGRAVE has found it will make to the planet *Mercury* on November 29-30th is most unusual and of great interest. According to the best published ephemeris of the comet, the distance separating it from the planet will not greatly exceed two millions of miles at the time of closest approach.

Professor PICKERING points out that careful observations made of the comet after November 29th will afford the means of determining the effect of the disturbance of its motion by *Mercury* with such accuracy that a good value of the mass of planet may be derived. Unfortunately the comet passes the Sun on November 26th, and at the time of nearest approach to *Mercury* it will still be so close to the Sun that for a number of days accurate observations will be impossible. Observers in the southern hemisphere, however, will have a good opportunity to secure observations later on—for not the least remarkable feature of this comet is the great length of its apparent path through the sky. Discovered in $3^h\ 18^m$ Right Ascension, and 34° 39′ North Declination, it moved north and west till it reached its maximum North Declination of 57° on September 30th. At that time its Right Ascension was $23^h\ 34^m$. Still continuing its westward motion, it turned also toward the south, and on November 4th was observed here in $17^h\ 9^m$ Right Ascension and −8° 10′ Declination. According to the ephemeris given by STRÖMGREN in *A. N.* 3821, the southwest-

erly motion continues until January 19, 1903, by which time the comet's position will be $11^h\ 18^m$ Right Ascension and —46° 27′ Declination. It then turns to the northwest, and by March 3, 1903, the last date of the ephemeris, it has reached $6^h\ 35^m$ Right Ascension and —11° Declination. At this time its theoretical brightness is still 0.6 that at discovery, and therefore it should be easy to observe until the end of March at least.

In view of its close approach to *Mercury*, and of the long duration of visibility of the comet, it seemed desirable to have a set of elements that would represent its motion with more accuracy than could be expected of the preliminary elements.

I therefore computed a set of parabolic elements based on the discovery position and my own observations made on October 2d and November 1st.

The elements had been derived and an ephemeris planned when the *Astronomische Nachrichten* containing STRÖMGREN'S ephemeris reached me. For comparison I give the two sets of elements here:—

| | STRÖMGREN. | AITKEN. |
|---|---|---|
| T | = 1902, Nov. 23.88925 M. T. Berlin. | Nov. 23.85514 Greenwich M. T. |
| $\omega$ | = 152° 57′ 28″.2 | 152° 57′ 50″.3 |
| $\Omega$ | = 49 21 7 .5 | 49 21 17 .3 |
| $i$ | = 156 21 9 .8 | 156 21 5 .1 |
| | 1902.0 | 1902.0 |
| log $q$ | = 9.603246 | 9.603212 |

Reduced to Greenwich mean time, STRÖMGREN'S T becomes Nov. 23.85204 Evidently the two sets of elements are so nearly identical that it would be waste of time to compute an ephemeris from mine.

It is hoped that in the next number of these *Publications* we may be able to reproduce some of the fine photographs of the comet that have been secured here by Mr. R. H. CURTISS.

November 12, 1902. R. G. AITKEN.

## OBSERVATIONS OF δ *EQUULEI.*

On account of the shortness of its periodic time and by reason of its forming a determinate connecting link between the visual and spectroscopic binaries, δ *Equulei* may be regarded as the most interesting of all the double stars. The early determinations of its orbit gave about 11.45 years as the